Trickle-L Spreads Irrigation Know-How

Need a fast, easy, inexpensive way to get an answer to a question about drip-irrigating an orchard, field, golf course, or garden?

Try the Internet discussion group called Trickle-L.

"If you post a question in the morning, you're likely to start getting answers from experts all over the world in just a few hours," says ARS agricultural engineer Thomas J. Trout. He directs the ARS Water Management Research Laboratory in Fresno, California, where Trickle-L was launched in 1994.

Trout says Trickle-L users include about 500 growers, scientists, extension agents, and irrigation equipment manufacturers—and likely some greenhouse managers, landscapers, and amateur gardeners as well. Most are from the United States, though experts from about two dozen other countries also belong to this "virtual community" on the Internet.

Trickle-L is what is known as a "mailing list" (also "listserv"), or subject-specific group. When a member of the group posts a message, that communication is automatically sent within a few minutes to the e-mail address of all other members.

"It's somewhat like a 24-hour electronic post office," says Richard M. Mead, who created Trickle-L while a soil scientist at the Fresno laboratory. Now a cooperator, Mead did the work with the aid of Jerome Pier, who was then at the University of Nebraska-Lincoln.

Trickle-L gets its name from the aboveground and underground (buried) drip-irrigation systems that deliver precise amounts of water to plants via tiny microsprayers or through emitters that squeeze out water a drop at a time.

For some crops, especially high-value fruits and vegetables such as strawberries or broccoli, drip or trickle irrigation frequently brings bigger yields and higher profits than better known irrigation techniques like furrow systems or overhead sprinklers. And buried-drip irrigation is being tried on alfalfa in California, cotton in Texas, and corn in Kansas—crops not traditionally irrigated this way.

"Admittedly," says Trout, "drip irrigation can have higher installation and maintenance costs. But the technology gives growers an unparalleled degree of precision in delivering water and fertilizer—or other farm chemicals—to plants. That saves water and prevents overuse of fertilizers that might otherwise leach into underground water supplies."

Trickle-L users incur no cost to join this cyberspace club, other than the expense of an Internet connection with e-mail.

Trickle-L, Trout says, is "gaining a reputation as one of the best places on the Internet to go to for friendly, well-informed help with problems of setting up and running drip-irrigation systems."

Users of Trickle-L have turned to other members for advice on everything from how to stop gophers from gnawing on buried irrigation tubing to how to set up the most cost-effective drip system for watering raspberries or asparagus.

Trickle-L, adds Trout, gives scientists at the Water Management Research Laboratory, and at other ARS labs as well, an inside look at the everyday problems growers and irrigation managers face.

"It's one of the fastest ways for us to learn about new, real-world issues," he says. "That helps us improve our research."

PETE MORTIMER (K1097-13)

Soil cut away to expose a drip irrigation line in a tomato field.

What's more, Trickle- L serves as a forum for scientists' theoretical discussions on topics like evapotranspiration—plants' use of water.

In addition to Trickle-L, the Water Management Research Laboratory also provides two other Internet resources—Salinity-L and a World Wide Web site.

Salinity-L is a discussion group for growers, researchers, and others who want to exchange ideas on how to cope with—and forestall—buildup of salts on arid farmlands. Salinization is a natural process that irrigated farming inadvertently accelerates.

Richard W. Soppe, a visiting scientist with the Fresno laboratory, established this specialized group in l995, in collaboration with Charles Sundermeier, a computer systems manager at the University of Nebraska-Lincoln.

"Both the Trickle-L and the Salinity-L discussion groups," Trout notes, "have increased the Water Management Laboratory's visibility worldwide."

The laboratory's WWW site has also garnered new, international attention for the research center. It is an award-winning site. It lists recent publications from the laboratory staff, describes computer software available from the researchers, and highlights experiments under way at the lab's network of study sites throughout central and southern California.

Microirrigation Forum, newest in the cluster of electronic irrigation information sources, was started in 1996 by Mead. "Microirrigation," he explains, "is the term used internationally to describe drip or trickle irrigation."

Still maintained by Mead, the forum lists other irrigation-related Internet sites; announces forthcoming meetings, conferences, and seminars; and archives some of the most useful discussions, called subject threads, from Trickle-L.

Internet users often refer back to Trickle-L discussions as the best source of information that might not be readily available elsewhere.

For example, an agronomist with one of the country's largest manufacturers of drip-irrigation equipment has frequently sent growers a copy of a 1996 Trickle-L discussion that explains how to correctly flush chlorine through irrigation tubing. The procedure kills bacteria or algae that could otherwise clog tiny emitters.—By **Marcia Wood,** ARS.

Thomas J. Trout is at the USDA-ARS Water Management Research Laboratory, 2021 S. Peach Ave., Fresno, CA 93727; phone (209) 453-3101, fax (209) 453-3122, e-mail ttrout@asrr.arsusda.gov

To subscribe to Trickle-L , send an e-mail message containing the words Subscribe Trickle-L followed by your first name then last name (do not use a subject line) to: listserv@unl.edu

To join Salinity-L, send an e-mail message with the words Subscribe Salinity-L followed by your first name then last name (do not use a subject line) in the body of the message to listserv@unl.edu

To visit the ARS Water Management Research Laboratory web site, enter http://asset.arsusda.gov/wmrl/wmrl.html

To browse the Microirrigation Forum, enter http://www.cybergate.com/~rmead ◆

Weed Control on the Central Plains

There's an axiom in the weed control business: The more closely related weeds are to the crops they infest, the harder it is to stop them. That's because growing conditions that favor the crops often also favor the weeds. And chemicals that kill the weeds often as not also kill the crops.

Agricultural Research Service agronomist Randy L. Anderson has come up with some new ways to control problem weeds in winter wheat and other crops grown on the Central Great Plains. A few of these weeds—volunteer rye (rye that escaped harvest and sprouted the next season), jointed goatgrass, and downy brome—have been reduced by up to 75 percent in his studies near Akron, Colorado.

Anderson found that timing of nitrogen fertilizer placement can help growing wheat more than it helps downy brome. Usually, farmers apply fertilizer at seeding time, a practice that benefits both wheat and weeds. But if fertilizer is applied about 5 months before planting, wheat can get ahead of the downy brome. That's because wheat roots extend deeper into soil than those of downy brome and can extract fertilizer that's moved a couple of inches down. Then, because the wheat is taller, downy brome grows in its shade and loses more of its ability to compete.

Two other practices make it more difficult for downy brome. Switching to a taller wheat like Lamar, rather than growing the more traditional shorter varieties like Tam 107 and Vona, also cuts sunlight to the weeds," says Anderson, who is at ARS' Central Great Plains Research Station. And seeding 65 pounds of wheat seed per acre rather than the current 40 pounds results in more shading, too.

These easy-to-use farm practices reduced growth of downy brome by 40 percent and, likewise, its weed seed production. Following the technique for two growing seasons cut this weed population by 75 percent. In other tests using these same practices, Anderson reduced jointed goatgrass and rye populations by 35 percent.

Anderson says farmers will experience some yield reductions, because taller wheat varieties don't produce as much grain as shorter ones. But, he adds, if growers get their weed problems behind them, they can switch back to shorter varieties and then come out ahead.

Additional research shows that crop rotations also play an important role in reducing annual weed problems. Adding a summer annual crop like corn or sunflowers to the traditional winter wheat/fallow scheme lengthens the time before the next wheat crop. This allows farmers a chance to apply herbicides that kill weeds but do not affect the summer annual crop.—By **Dennis Senft,** ARS.

Randy L. Anderson is at the USDA-ARS Central Great Plains Research Station, P.O. Box 400, Akron, CO 80720-0400; phone (970) 345-2259, fax (970) 345-2088, email rlander@lamar.colostate.edu ◆